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**PORT OF PORT TOWNSEND  
AND  
WASHINGTON STATE DEPARTMENT OF ECOLOGY  
  
MARINE INDUSTRIAL DEVELOPMENT OPTIONS  
FOR  
GLEN COVE  
  
A PRELIMINARY ASSESSMENT**

**JUNE 1985**

**"THE PREPARATION OF THIS REPORT WAS FINANCIALLY AIDED THROUGH  
A GRANT FROM THE WASHINGTON STATE DEPARTMENT OF ECOLOGY  
WITH FUNDS OBTAINED FROM THE NATIONAL OCEANIC AND ATMOSPHERIC  
ADMINISTRATION, AND APPROPRIATED FOR SECTION 306 OF THE  
COASTAL ZONE MANAGEMENT ACT OF 1972."**

**TAMS**

**TIPPETTS-ABBETT-McCARTHY-STRATTON ■ ENGINEERS AND PLANNERS**

PORT OF PORT TOWNSEND  
AND  
WASHINGTON STATE DEPARTMENT OF ECOLOGY

MARINE INDUSTRIAL DEVELOPMENT OPTIONS

FOR

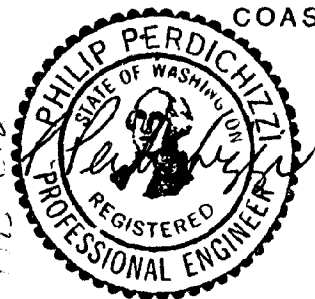
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A PRELIMINARY ASSESSMENT

JUNE 1985

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COASTAL SERVICES CENTER  
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CHARLESTON, SC 29405-2413

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NOV 1 1985

TAMS

TIPPETTS-ABBETT-McCARTHY-STRATTON ■ ENGINEERS AND PLANNERS

HD2329, 1025 1985-0-0

## ABSTRACT

1: Author:

Michael G. Horton, TAMS Engineers, Seattle, Washington.

2: Subject:

Waterfront Industrial Land Use Assessment - Glen Cove, Port Townsend

3: Published: June 15, 1985

4: Sponsors:

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9: ABSTRACT

The Glen Cove Site, located just outside the southern boundary of the city of Port Townsend is a 300 acre area which has been designated for industrial use in the Jefferson County Comprehensive Master Plan. The natural slopes over the entire area are relatively steep, and access to the water is gained through a paved road known as Ferry Street.

The study is a preliminary investigation of waterfront related industrial options for the site. Demand is briefly discussed in order to derive functional requirements for each alternative and construction costs are presented. Potential environmental concerns form a major part of the analysis.

The major conclusion of the study is that the topography of the uplands and the shallow water depth in Glen Cove are significant constraints to the development of industries such as a commercial shipyard, pleasure craft repair yard or marine cargo handling terminal. The only area readily available for medium or large scale waterfront industrial use is a freshwater lagoon owned by the Port Townsend Paper Company which was seen to support various species of aquatic birds, wildfowl and small mammals.

The location of a marina at the site is a long term option when the capability to extend the present Port Townsend Boat Haven has been exhausted. Dredge and fill requirements in the intertidal zone would be significant environmental concerns.

Developments that appear to be more compatible with the site are a fish processing plant or non water related industries based on 5 acre parcels. The site would also be a good location for a boat launch ramp.

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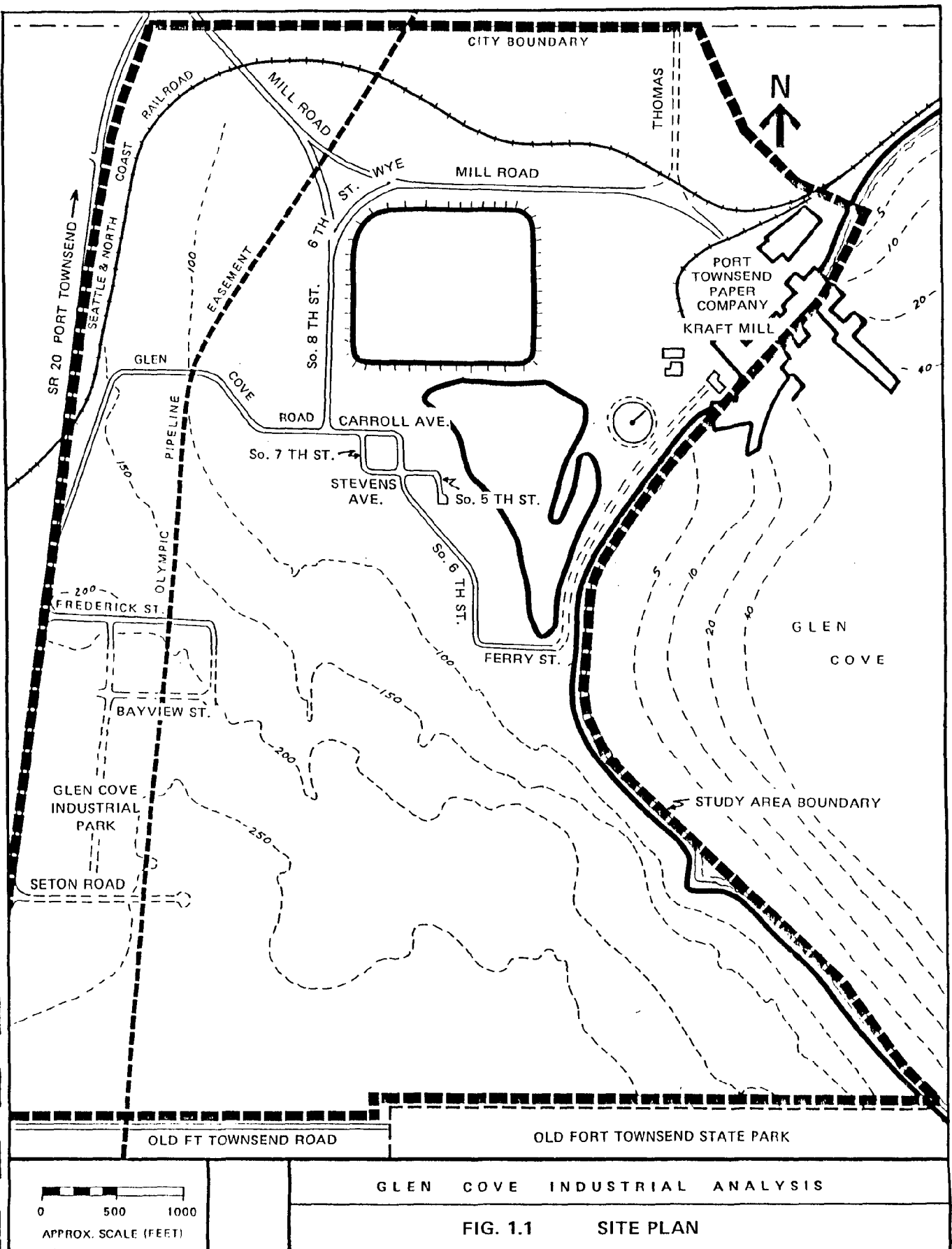
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## 1: STUDY OBJECTIVES

The following analysis addresses a number of alternative development scenarios for the Glen Cove site. The area shown in Fig. 1.1 has been identified in the Jefferson County Comprehensive Master Plan as a major industrial area containing approximately 300 acres of developable land and a mile of waterfront. Development options reflect the classification of the area and are generally limited to industries requiring waterfront access or adjacency. The purpose of the study is to provide a review of the suitability of the site for a number of classes of waterfront related industrial developments. In reviewing alternatives, a brief assessment of overall planning requirements is presented but the reader is cautioned that demand, economic feasibility and conflict or compatibility with existing facilities are not addressed in detail.

It is also recognized that although the list of opportunities studied in this report is limited to waterfront related industries, the site has a number of advantages for a variety of potential businesses which do not require direct access to the water.





## 2: SITE CHARACTERISTICS

### 2.1: NAVIGATION

The sea bed in front of Glen Cove shelves at an initial slope of 2 percent to 1.3 percent to the 1 fathom line and then steepens to about 4 percent to a mid channel depth of 60 to 85 ft. The 40 ft contour, which is considered to be adequate for cargo vessel navigation is located some 1,000 to 1,200 ft from the beach line.

The approaches to the area are therefore adequate for most modern cargo or commercial vessels as evidenced by the use of the Port Townsend Paper Company pier by ships in the 20,000 to 30,000 deadweight tonnage (dwt) range.

### 2.2: CURRENTS AND LITTORAL DRIFT

The Coastal Zone Atlas published by the Washington State Dept of Ecology indicates a north-south littoral shoreline movement from the Paper Company Plant to approximately the mid point of the beach and a south-north movement from Kala Point northwards. The drift trend has created the fine sand crescent accretion beach shown in Fig. 2.1, which extends from the Paper Plant to the commencement of the Bluff where coarser gravels are found.

Currents in the Cove are mild, circulatory and tidal, being dominated by the Oak Bay Cut (Portage Canal) - Port Townsend confluence which generates mid channel currents up to 3.0 knots at maximum ebb and flow.

### 2.3: WAVES

As seen in Fig. 2.1, the wave climate at Glen Cove is mild as the north or south storm directions have limited fetch distances at the site. The Coastal Zone Atlas indicates 6 inch to 2.0 ft waves from the southeast 5 percent of the time and from the east



4 percent. Similar wave height frequencies of 1 percent are also shown for north east and southerly directions. The remainder are waves of less than 6 inches which are considered to be calms for record purposes.

#### 2.4: TIDES

Neap tidal range is approximately 5 ft with spring tide ranges increasing to 12 - 13 ft, typical of Upper Puget Sound. Annual lowest low water is of 4.5 ft below MLLW. Tidal heights are:

Extreme High Water.....	12.50 ft
Mean Higher High water.....	8.40 ft
Mean High Water.....	7.70 ft
Mean Tide Level.....	5.10 ft
Mean Lower Low Water.....	0.0
Extreme Low Water.....	-4.50 ft

#### 2.5: WATER ACTIVITIES - GLEN COVE

The area is used by the Port Townsend Paper Company as an anchorage for wood chip barges which are buoyed in Glen Cove and taken to the company dock for discharge. The firm also operates their own pier for loading exports of paper products and pulp to ocean going vessels.

Plans by Sea Farms of Norway to establish an Aquaculture project to the south of the Cove are understood to be progressing to the operational stage. The project will involve the placing of salmon rearing pens approximately 1000 feet out from the shoreline in an area of clean water with moderate but regular currents.

No buoys for small boat anchorages were observed during visits to the site.

## 2.6: LAND USE AND PROPERTY OWNERSHIP

Property ownership and land use are shown in Figures 2.2 and 2.3, based upon information presented in the 1982 Glen Cove Water Supply study prepared by Hosey and Associates. The largest parcels are owned and currently used by the Port Townsend Paper Company. The northern parcel, approximately 75 acres, is used for industrial processing and raw material storage at the Kraft Mill, while part of the 204 acre southern lot is used for solid waste disposal.

A residential area of some 30 to 35 single family homes is centered around Carroll Avenue and South 6th Street. A boat repair operation is located at the shoreward limit of South 6th. No permanent haul out facilities are used by this yard.

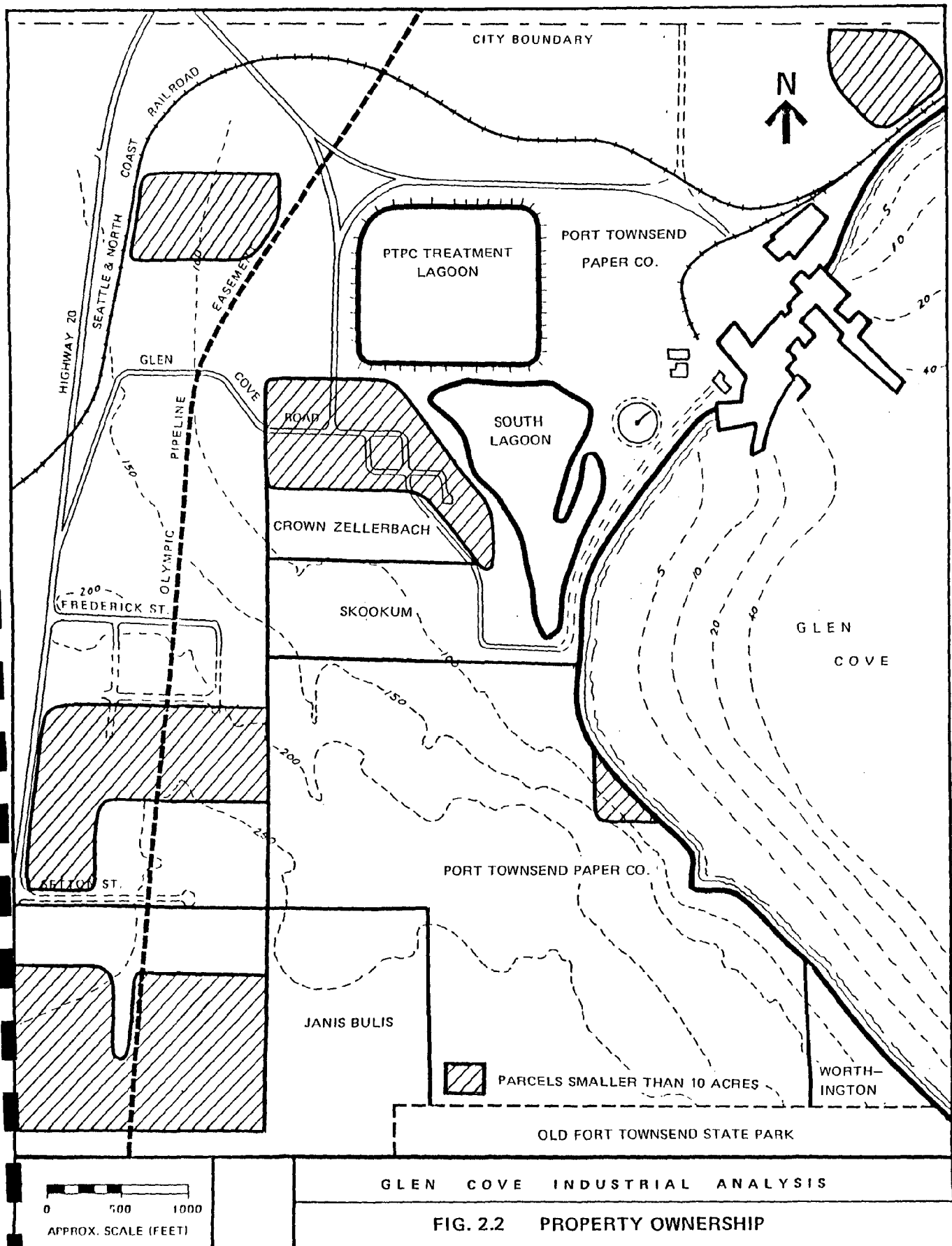
The primary access to the beach is through a right of way owned by Skookum marine, linked to the 30 acre plot shown in Fig. 2.2.

The Glen Cove Industrial Park is located alongside highway SR 20 at Seton Rd. and a number of industries have been established around Frederick St., connecting with the Park.

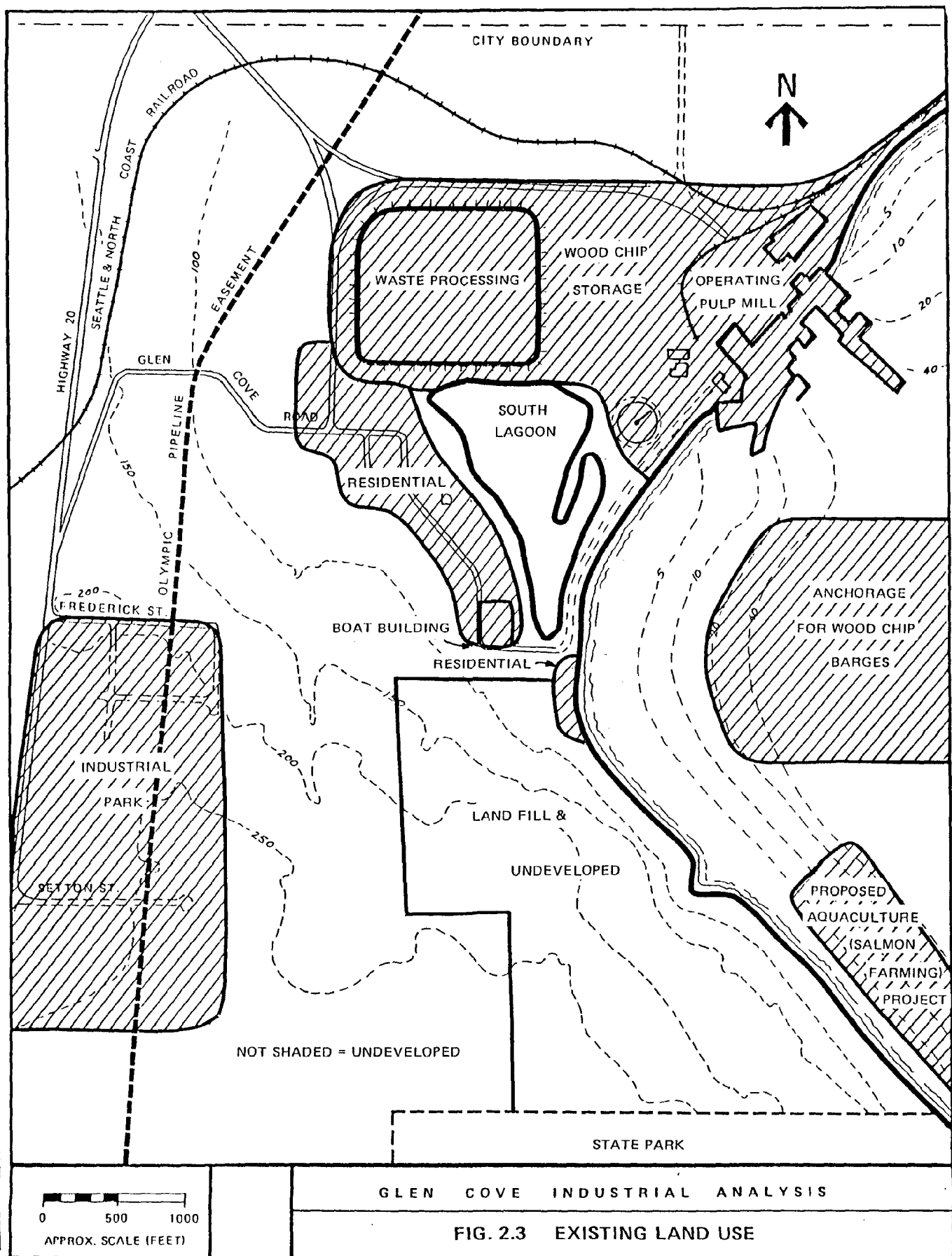
The site southern boundary is limited by the Old Ft Townsend State Park and the remainder of the study area is generally undeveloped.

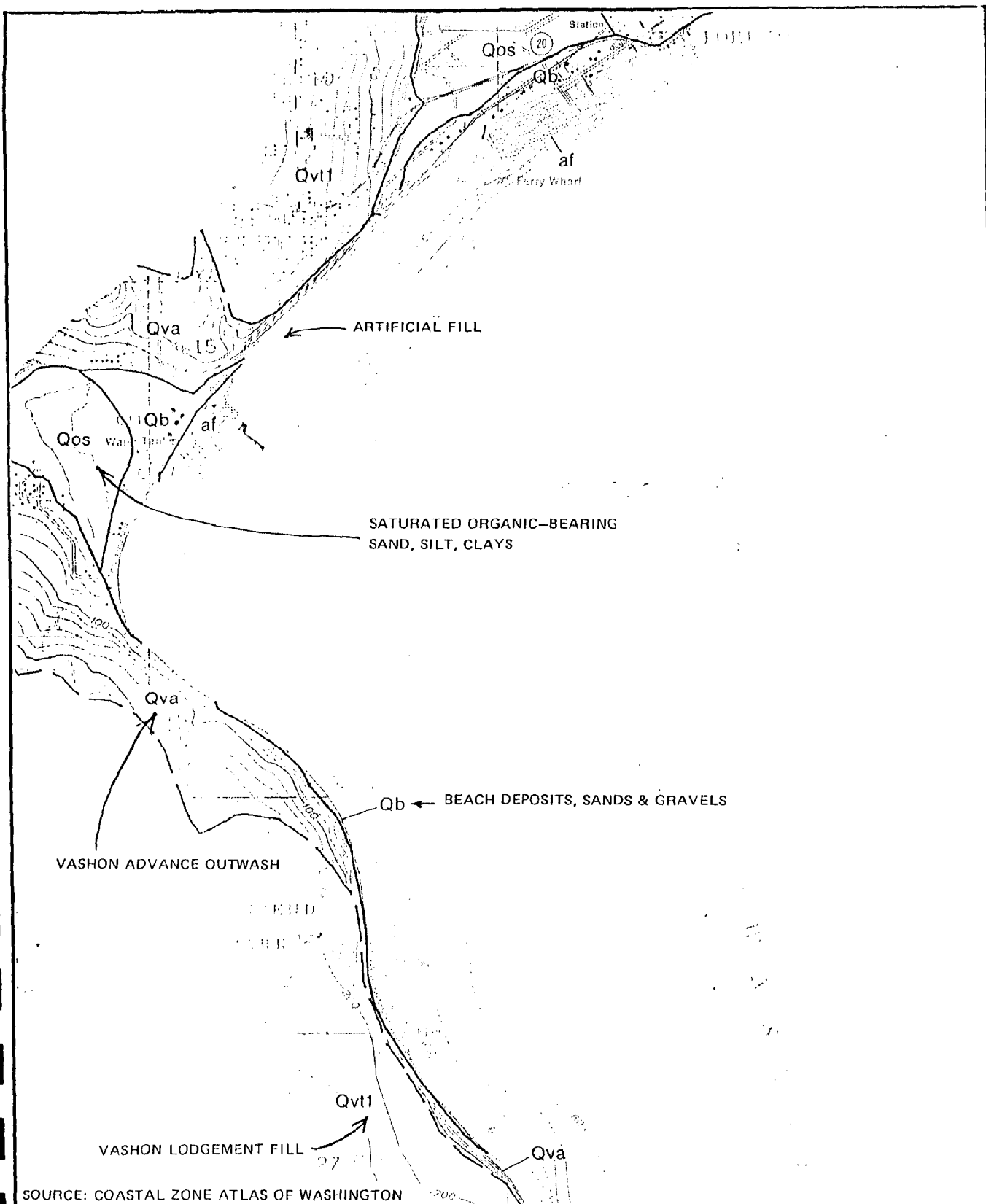
## 2.7: UPLANDS GEOTECHNICAL CHARACTERISTICS

Geotechnical characteristics of the site are shown in Fig. 2.4. The lagoon areas are on generally organic silts and reworked fill material with the uplands portions overlaying clay deposits identified as "Vashon Advance Outwash".



SOURCE: GLEN COVE WATER SUPPLY STUDY





GLEN COVE INDUSTRIAL ANALYSIS

FIG. 2.4 GEOTECHNICAL CHARACTERISTICS

## 2.8: TOPOGRAPHY

As can be seen in Fig. 2.5, most of the site is composed of wooded slopes which average a 10 percent grade or steeper and the area offers very little flat land for development. The only level parcel greater than 10 acres is the southerly of the two lagoons owned by the Port Townsend Paper Company, which would obviously require filling before conversion to industrial use. This is especially restrictive for industries such as a ship yard or marine terminal where flat rectangular or square parcels which are adjacent to the water are essential to an efficient and economic operation.

The transition from the uplands to the beach is evenly graded from the Paper Company Kraft Mill southwards for a distance of approximately 1,500 ft. At that point the shoreline bluff rises sharply to a height of 100 ft.

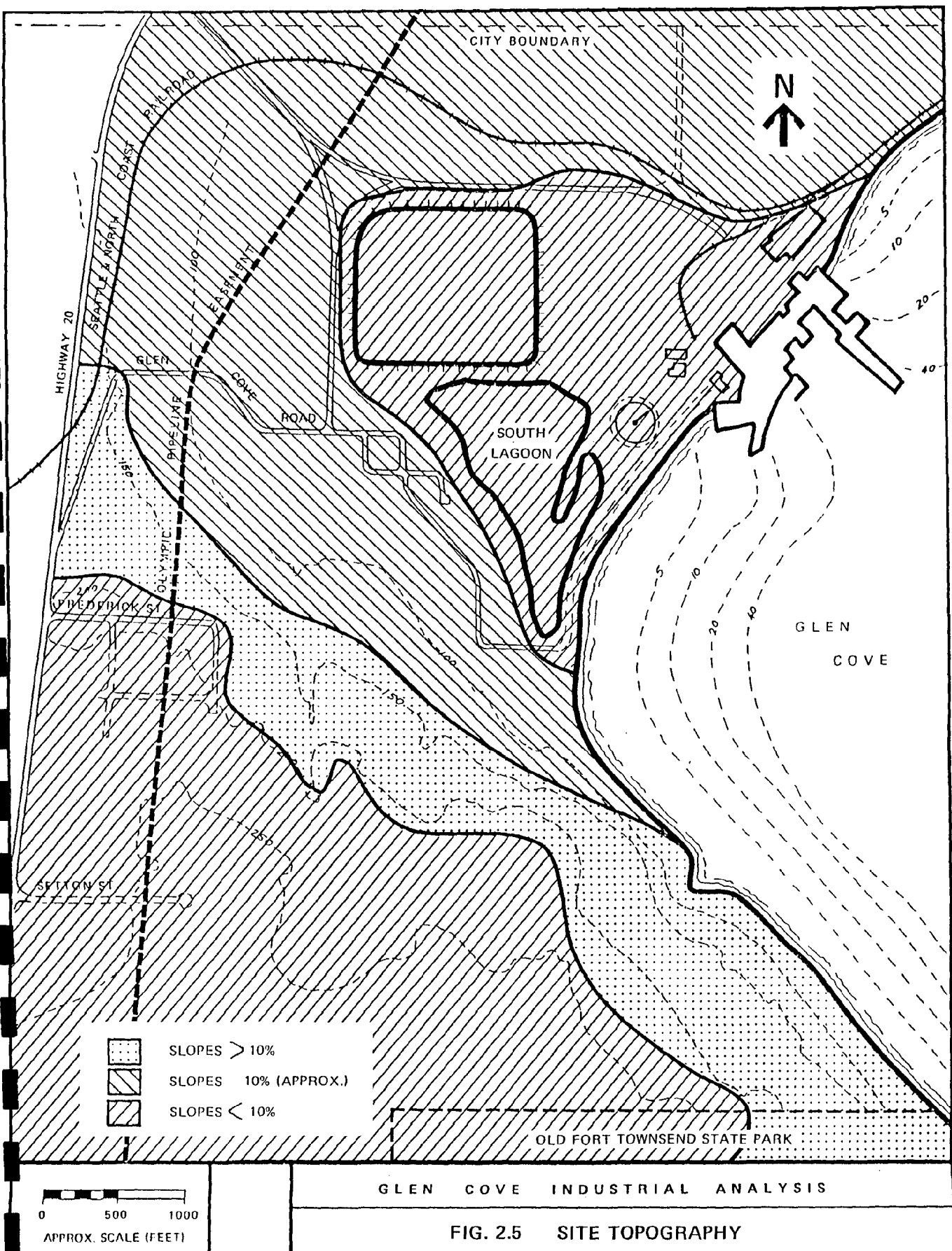
Since the south lagoon is the only area within the study boundaries that offers the necessary 20 to 25 acre flat open space adjacent to the waterfront, it is therefore considered to be the preferred location for any major shoreside industrial activity.

## 2.9: ACCESS

The study area has vehicular access from Highway 20. These roads average 18 ft. width and are paved. However, the access through the Glen Cove residential area appears to be suitable only for light traffic. Average slopes on the entry roads are 5 to 10 percent and the most extreme curve has a 120 ft radius.

A non-operating rail line passes through the western edge of the site and would offer a good rail link if revived in part or whole.





A number of "paper" streets are shown on the Plats for the area, and a Right of Way extends through an extension of Frederick Street to the beach at Ferry Street.

#### 2.10: UTILITIES

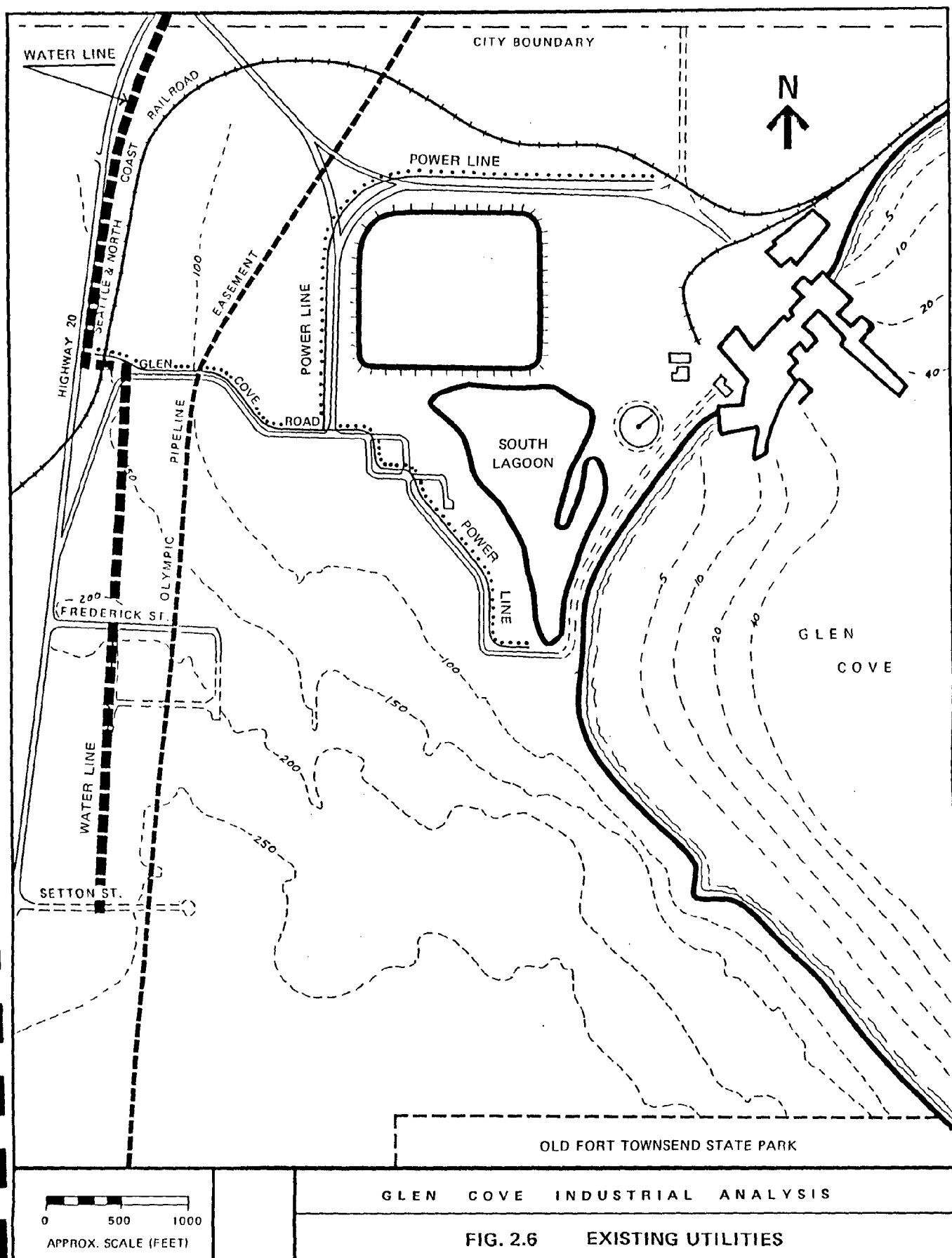
The main Olympic Water Pipeline passes through the site and serves the paper mill. The recently constructed link from the 10 inch City main links Otto street to the limit of the residential area with "tees" at Glen Cove Rd., Seton Rd. and Frederick Street as shown in Fig. 2.6. Plans prepared in 1982 provide for the eventual extension of the water system to the entire area.

Electricity lines follow Glen Cove Rd to the beach access and could easily be extended to serve additional development if required.

There are no sewer lines in the area and the City of Port Townsend has declared that it will not provide service outside city boundaries. This decision is, however, the subject for discussion at an upcoming joint meeting between officials from Jefferson County, the City of Port Townsend and the P.U.D., in an effort to formulate a regional policy. The steep slopes at the site are generally unsuitable for drain fields, and the random and variable soils are a further disadvantage. Any piped sewer system would require its own local treatment plant or a force main to the City system (assuming the necessary policy change) and large volume industrial waste water disposal would require detailed engineering and field studies.

#### 2.11: ENVIRONMENTAL CHARACTERISTICS

There appears to be very little documented information on the environmental inventory of the area. Annual water quality measurements are taken in the Cove as part of the monitoring process for the waste water disposal permit held by the Paper Company but no sampling of marine life, fauna or flora was available at the time of this study.



The following comments therefore represent observations taken during a field visit to the site, discussions with agency representatives and information taken from the WDEC Coastal Zone Atlas.

#### 2.11.1: BEACH AND INTERTIDAL ZONE

##### SHELLFISH

The fine sand beach from the Paper Mill to the southerly bluff, is reported to support modest clam harvests although no commercial shellfishing is carried out in the area. Further south, as shown in Fig. 2.7, geoduck beds are reportedly of commercial size.

##### FISH

The area is used from March to June by juvenile migrating salmon but no critical spawning streams were identified in the study area.

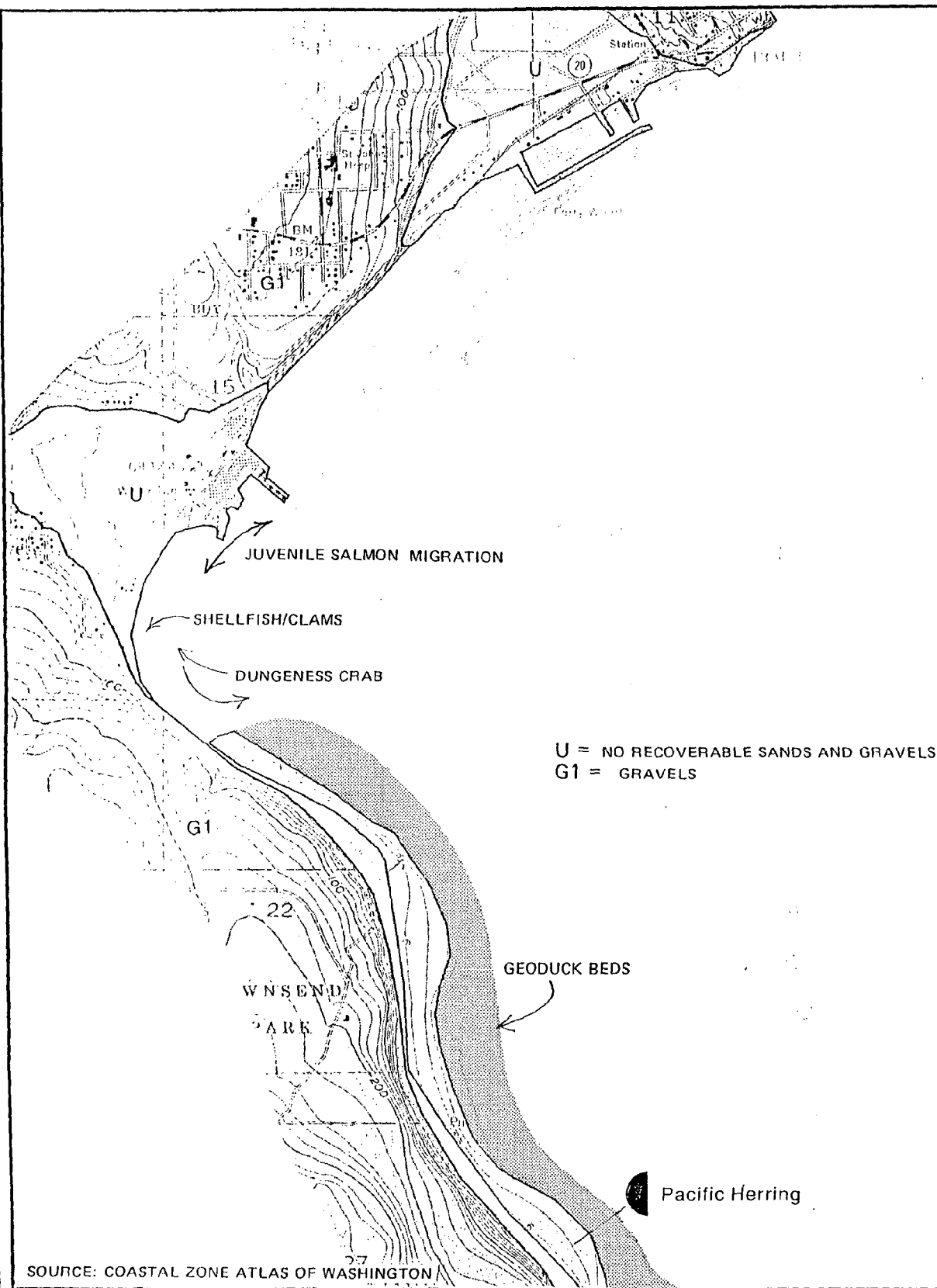
Pacific herring spawn in a 1 to 2 mile shoreline strip commencing at the southern half of the study shoreline opposite the geoduck beds.

##### CRUSTACEANS

Some Dungeness crab are believed to inhabit the sub tidal zones in the area although no sampling has confirmed populations or densities.

#### 2.11.2: LAGOONS

The upper Lagoon is a waste water treatment facility for the paper mill and therefore supports no wildlife. The southerly lagoon, which is retained by the beach road, supports various species of wildfowl and small mammals. No endangered or critical fish species were identified as inhabiting the pond.



GLEN COVE INDUSTRIAL ANALYSIS

FIG 2.7 MARINE HABITATS AND UPLANDS NATURAL RESOURCES

### 2.11.3: VEGETATION

The uplands area supports a variety of trees and the southern lagoon is covered with reeds, bullrushes and aquatic plants. Dune grass is found above the High water mark on the sand beach areas.

### 3: PORT OF PORT TOWNSEND COMPREHENSIVE MASTER PLAN

Although not specifically addressed in the 1981 Port of Port Townsend Comprehensive Plan, Glen Cove was suggested as a potential site for a heavy lift and repair facility for boats over 100 ft long. All other recommendations in the report emphasized the benefits of centralization of future marine facility development by expansion at or adjacent to existing locations.

### 4: PERMITTING PROCESS

A number of federal, state, county and local permits are required before any development may take place at the Glen Cove site. Probably the most significant are the State permits required under the Washington State Shorelines Management Act, the Corps of Engineers Section 10 and 404 procedures, and the Hydraulic Code Rules (WAC 220-110) and permit by the Washington State Department of Fisheries and Department of Game.

The permitting process applies to any project proposed to impact wetlands, subtidal and, tidal areas below the Mean High Water line and all uplands within 200 feet of Mean High Water. This includes dredging, landfill or over water fill, or any artificial structure construction, and a large or sensitive project will also require Environmental Impact Statements prepared under the requirements of the National Environmental Policy Act (NEPA) of 1969 and the State Environmental Act (SEPA).

Greatly simplified, the procedures involve the submittal, to the US Army Corps of Engineers, applicable state agencies, and the county of separate permit applications outlining the size, components, materials quantities and location of the proposed work. Both the Shorelines Management Act and Corps Section 10-404 processes require public notice periods and public hearings. Public agencies and interested private groups typically involved might include:

#### Federal Agencies

- EPA
- Corps in house groups (Hydraulics, Coastal engineering, Regulatory functions).
- US Fish and Wildlife Service
- National Oceanic and Atmospheric Administration (NOAA)
- National Marine Fisheries Service (NMFS)
- US Coastguard

#### Washington State Agencies

- Dept of Ecology
- Dept of Fisheries
- Dept of Game
- Dept of Transportation
- Dept of Natural Resources
- Archaeology and Historic Preservation Office
- Conservation Commission

Jefferson County (Shoreline Management Act, Highways, Planning)

City of Port Townsend

Adjacent Land owners.

Special Interest Groups

Local Indian Tribes

Interested private individuals.

Following the review and comment period, one or more public hearings are held to discuss the application. If Environmental Impact Statements are required under NEPA and SEPA regulations they must address agency and citizen concerns, consider alternative locations for the project and clearly establish the need for the work, address environmental impacts and propose mitigation measures to replace loss of intertidal habitat, wetlands etc.

If all identified local, state, and regional concerns are addressed to the satisfaction of the agencies of jurisdiction, the necessary permits will then be issued.



Evaluation factors used by the agencies in their review include:

- Aesthetics
- Air Quality
- Coastal and Shoreline Processes
- Conservation
- Economics
- Energy demands
- Fish and Wildlife values
- Flood damage Prevention
- Food Production
- Historic and cultural Resource values
- Impact on infrastructure
- Impact on adjacent property owners
- Land use appropriateness
- Navigation
- Need for the Project \*
- Physical environment
- Public Safety
- Recreational Impacts
- Traffic impacts
- Waste disposal - solids and liquids
- Water Quality

\* The County, State, and the U.S. Corps of Engineers consider "Need for Project" to be an extremely important factor when evaluating applications for projects in areas that are sensitive biologically or where citizen concerns are significant. In general, agencies will object to speculative projects unless there is a strong positive market or demand analysis to support the application.

## 5: POTENTIAL USES OF GLEN COVE

### 5.1: BOAT REPAIR

#### 5.1.1: COMMERCIAL SHIP REPAIR YARD

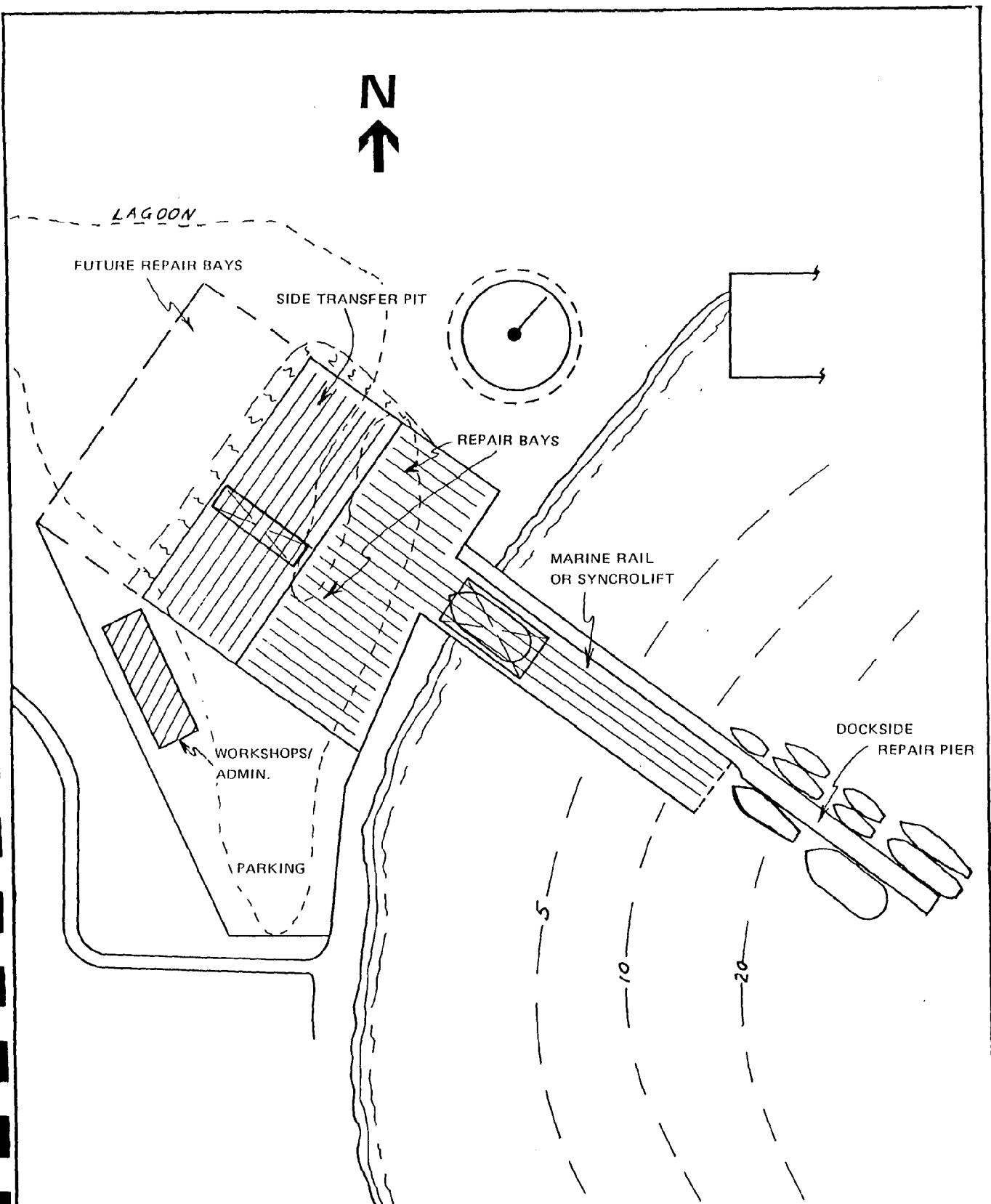
##### DEMAND

As a boat repair center, Port Townsend currently offers haul-out storage and repair facilities to pleasure and commercial craft up to a total weight of 60 tons. In planning for additional facilities it is logical to address existing demand that cannot be accommodated at the existing facilities in the area.

These vessels include Bering Sea crabbers and draggers and the newer breeds of catcher processor vessel in the slowly and steadily expanding Northwest and Alaskan bottom fisheries.

##### FUNCTIONAL REQUIREMENTS

As distances to the fishing grounds have increased, the trend is to larger vessels and a typical offshore vessel is now 150 feet long. In establishing planning criteria for a repair and service facility for commercial boats, fishing or otherwise, it is important to realize that 90 percent of all work is carried out while the vessel is at a wet dock and not on a ramp or marine hoist. Hence dry storage and shoreside work areas are less critical to the overall viability of a project than the need to provide adequate dockside footage and adjacent working area for on board repairs and maintenance. A commercial repair yard capable of offering a full and competitive service to the fleet would require the following elements as illustrated in Fig. 5.1.



GLEN COVE INDUSTRIAL ANALYSIS

FIG. 5.1 COMMERCIAL VESSEL REPAIR YARD

Sheltered water area of up to 10 acres with 1.0 foot maximum storm wave height.

Dockside (piers) space for 5 vessels (minimum) - 1,000 to 2,000 feet in length with 18 to 20 feet alongside.

Alongside working area for each vessel - 5,000 square feet.

Ship lift, marine rail, dry dock or graving dock - 1,500 to 2,500 tons.

Cranes at dock (15 to 50 tons) and in repair yard (10 to 20 tons).

Repair yard, flat with rails or transfer pit to haulout area - 5 to 10 acres.

Workshops for welding, paint, electrical/electronics, machine shops - 6,000 square feet total.

Administration building, restrooms etc.

Highway access.

Parking for 25 to 40 employees and visitors.

Electricity, water, and telephone supply.

#### ENVIRONMENTAL ASPECTS

The major environmental constraint to this alternative is the need to fill in the productive southern lagoon in order to provide the necessary open space for a repair yard and workshop area. Other concerns would be for water quality in the area of the wet docks where repair work is carried out, noise and local resident concerns over night time work, and the presence of transient labor or boat crews in the area.

It is likely that an application for permits to develop the site for a commercial shipyard could meet a number of important objections from local, state, and federal agencies. Local citizen opposition could be significant.

**PROJECT COMPLETION REPORT**  
**JEFFERSON COUNTY**  
**SHORELINE MANAGEMENT**  
**ENHANCEMENT**

**JUNE 1985**

The preparation of this report was financially aided through a grant (G085016B) from the Washington State Department of Ecology with funds obtained from the United States Department of Commerce, appropriated for Section 306 of the Coastal Zone Management Act of 1972.

## **SUMMARY OF ACCOMPLISHMENTS**

Two tasks were undertaken during the grant period to aid in the management of the county's shorelines. The completion of the tasks resulted in two published documents.

The Port Townsend Waterfront Erosion Control and Shore Enhancement study examines the erosion problems along a portion of Port Townsend's waterfront and discusses restoration solutions. The study was done by a consultant, Wolf Bauer, P.E., for the City of Port Townsend. The study is described under the abstract.

The Marine Industrial Development Options for Glen Cove, A Preliminary Assessment is an analysis of the Glen Cove waterfront area being developed as a terminal for marine-related industries. The study was done by consultants for the Port of Port Townsend, Tippetts-Abbett-McCarthy-Straton. The study is described under the abstract.

## ABSTRACT

**TITLE:** Port Townsend Waterfront Erosion Control and Shore Enhancement

**AUTHOR:** Wolf Bauer, P.E., Shore Resource Consultant

**SUBJECT:** The study is on the enhancement of a portion of a waterfront area in Port Townsend.

**PUBLICATION DATE:** June 15, 1985

**SPONSORS:** Washington State Department of Ecology and City of Port Townsend

**SOURCE OF COPIES:** Wolf Bauer, 5622 Seaview Avenue Northwest, Seattle, Washington 98107

**PROJECT NUMBER:** G085016B

**CONTENTS:** Four drawings and four explanatory pages.

**ABSTRACT:** The study is an examination of the cause of erosion of 1.5 mile of shoreline in downtown Port Townsend. These shorelines once were accretion beaches before their feeder material source was cut-off by development. The study includes detailed designs and specifications for the restoration of three sites to accretion beaches.

## ABSTRACT

1: Author:

Michael G. Horton, TAMS Engineers, Seattle, Washington.

2: Subject:

Waterfront Industrial Land Use Assessment - Glen Cove, Port Townsend

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The study is a preliminary investigation of waterfront related industrial options for the site. Demand is briefly discussed in order to derive functional requirements for each alternative and construction costs are presented. Potential environmental concerns form a major part of the analysis.

The major conclusion of the study is that the topography of the uplands and the shallow water depth in Glen Cove are significant constraints to the development of industries such as a commercial shipyard, pleasure craft repair yard or marine cargo handling terminal. The only area readily available for medium or large scale waterfront industrial use is a freshwater lagoon owned by the Port Townsend Paper Company which was seen to support various species of aquatic birds, wildfowl and small mammals.

The location of a marina at the site is a long term option when the capability to extend the present Port Townsend Boat Haven has been exhausted. Dredge and fill requirements in the intertidal zone would be significant environmental concerns.

Developments that appear to be more compatible with the site are a fish processing plant or non water related industries based on 5 acre parcels. The site would also be a good location for a boat launch ramp.



## CONSTRUCTION COSTS

Construction costs for a Commercial Ship Repair Yard at the site are:

Description	Cost
Site Preparation	1,224,000
Pier	2,420,000
Marine rail	1,300,000
Repair Yard, paving, rails	1,000,000
Workshops, office, restrooms	227,500
Utilities	750,000
Parking lot, Access, fence	250,000
Sub total	7,171,500
Admin, engineering, permit	645,000
Contingencies @ 20 percent	1,565,000
TOTAL	\$9,381,500

Note: Y3 => cubic yard; Y2 => square yard,  
F2 => square foot etc; LS => Lump sum.  
LF => lineal foot

## OVERALL FEASIBILITY

The site is not considered to be a particularly good location for a medium sized ship repair yard, principally because the repair docks should be built alongside the repair yard for operational efficiency. The pier construction shown in Figure 5.1 is a less efficient compromise dictated by the shallow water depths in Glen Cove. Land reclamation below the Mean Low Water line was not considered to be an economical means of providing a more useful facility layout, since the dredging and fill costs are high and permitting difficulties would be a major obstacle.

### 5.1.2: PLEASURE AND SMALL COMMERCIAL BOAT REPAIR

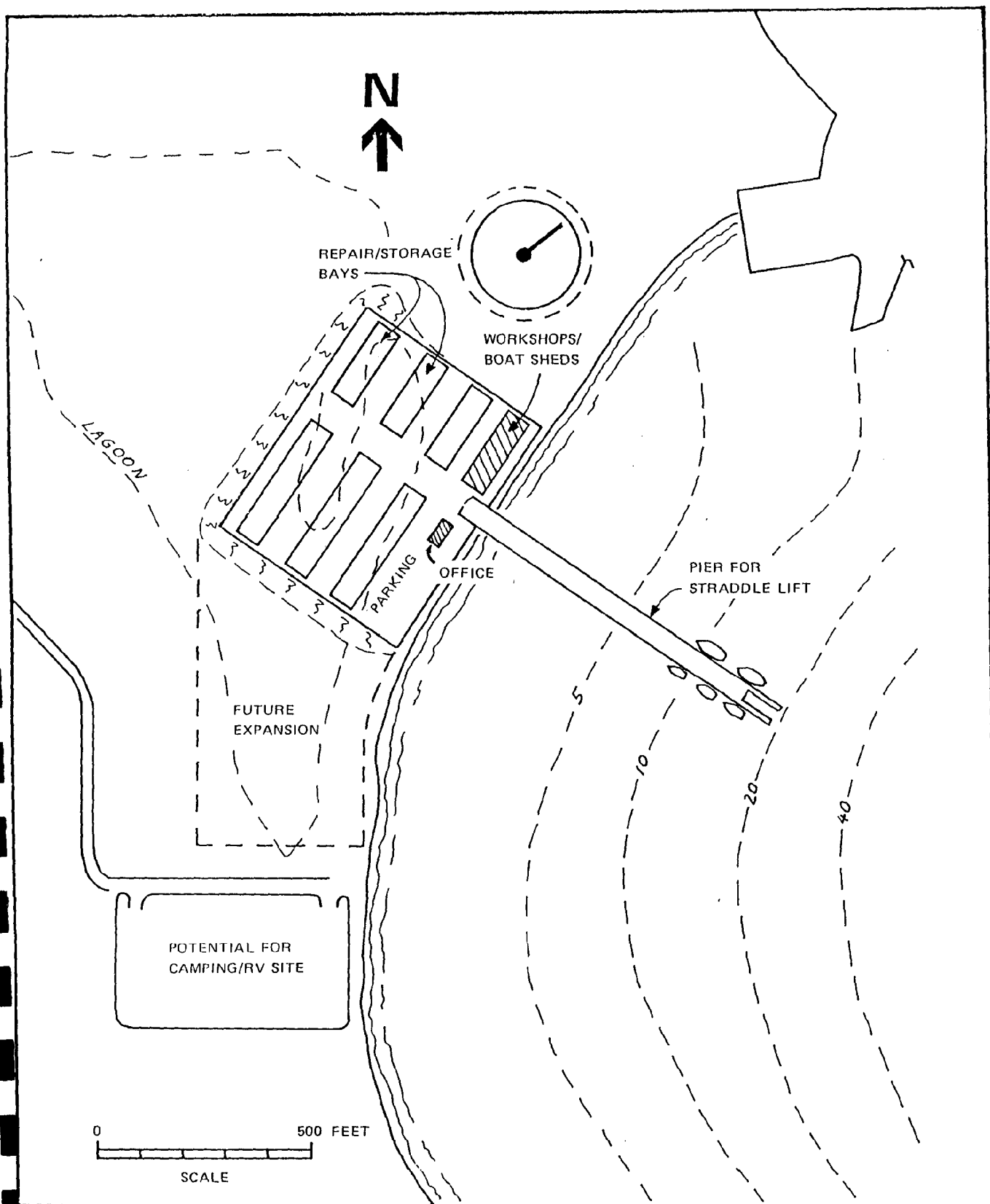
#### DEMAND

Generally, pleasure boat repair facilities will be combined with or adjacent to a marina to provide an integrated service to the boat owner. With a predominance of wooden boats in the Port Townsend area for repair, weights tend to be higher than found at yards in other areas. A repair yard at Glen Cove would therefore expect to handle sailboats and motor boats up to 80 feet in length with the average haul out being for a 35 to 50 foot craft weighing less than 60 tons.

#### FUNCTIONAL REQUIREMENTS

The travel hoist or straddle carrier is one of the most common lift vehicles found in boat yards since it offers the flexibility to both haul and move the vessel around a work area at an economic cost. Most units are in the 40 to 80 ton range but 150 to 250 ton hoists are occasionally found. Tire loadings are, however, extremely high with the larger lifts and concrete runways are often needed where soil conditions are less than ideal. A limitation of the travel hoist which particularly applies to Glen Cove is the need for a level grade for moving boats to and from an open storage area. A 6 percent grade is generally accepted as the maximum for lifts running on a paved surface, and this is considerably less than the grades at Glen Cove.

In comparison to the significant amount of work done at a wet slip for large commercial craft, most maintenance work on pleasure craft is more conveniently accomplished out of the water. Dockside requirements are therefore minimal. The scheme shown in Figure 5.2 illustrates a typical repair yard for the fleet mix currently found in Puget Sound marinas.



GLEN COVE INDUSTRIAL ANALYSIS

FIG. 5.2 PLEASURE CRAFT REPAIR YARD

Elements required include:

Hoist - Straddle carrier (60 to 80 tons) on purpose built pier.  
Water depth 12 to 14 ft at hoist at MLLW.  
Average wave height not more than 0.5 ft.  
Paved, flat access way to repair/storage yard.  
Fenced, secure repair yard 2 to 4 acres.  
Covered storage bays (10 to 15) for boat repair or construction.  
Workshops - 3,000 to 5,000 sq ft.  
Employee/customer parking for 50 vehicles.  
Water, electricity telephone and sewers.

#### ENVIRONMENTAL ASPECTS

The major environmental concern is the loss of the wetlands as for the commercial shipyard option. Other concerns, such as noise, traffic, and nuisance level, are not considered to be serious factors since the area is already designated for industrial use.

## CONSTRUCTION COSTS

Construction costs for a Repair Yard for Pleasure Craft at Glen Cove are:

DESCRIPTION	COST
Site Preparation	204,000
Pier for travel hoist	1,650,000
Travel Hoist (80 ton)	250,000
Repair Yard	120,000
Covered storage	200,000
Workshops, office, restrooms	120,000
Utilities	150,000
Parking lot, Access, fence	125,000
Sub total	\$2,819,000
Admin, engineering, permit	300,000
Contingencies @ 20 percent	600,000
TOTAL	\$3,420,000

## OVERALL FEASIBILITY

Although a repair yard handling pleasure boats and small commercial craft is considered to pose few compatibility problems with the surrounding area and property owners, it still requires a useful flat parcel of land adjacent to the water. Since the natural slopes on Ferry Street are steeper than a travel hoist can handle this again means filling in part of the lagoon to provide a repair and storage yard this presents environmental obstacles to the acquisition of a permit.

A further detracting element is the separation of the facility from the existing commercial center. Port Townsend, while lacking the capacity to haul larger vessels, has considerable

area available for expansion and an established infrastructure. This significantly affects the outcome of the permit applications since it would be difficult to demonstrate that the demand could not be accommodated elsewhere with a lesser impact.

A major advantage of a yard at Glen Cove might be the possibility of providing a RV park or camp site nearby to enable boat owners to stay near their boats at low cost during the winter or while working on long projects. While this land use is not completely compatible with the designated use for the area it would address a definite need that the Boat Haven area yards are unable to address due to City regulations.

No major difficulties are seen with utilities or access since electrical and water demands are light.

## 5.2: PLEASURE BOAT MOORAGE

### 5.2.1: DEMAND

The Port master plan recommends expansion of the existing boat haven to accommodate future demand for pleasure craft moorage. This would be accomplished in the short term by reorientation of the floats and later by expansion and dredging to the west. Increased participation in Point Hudson was also recommended.

In fact, the high level of demand for additional slips in Jefferson County and Puget Sound originally forecasted by the Corps of Engineers (1980) and others has not yet materialized and the current Boat Haven waiting list could be accommodated by the addition of 50 new slips in the existing basin. The Old Alcohol Plant marina at Hadlock is also being expanded, and therefore there is unlikely to be any severe pressure for a completely new facility at Glen Cove within the next 10 to 15 years.

### 5.2.2: FUNCTIONAL REQUIREMENTS

Based upon current trends, construction costs, and moorage revenues, any new purpose built marina will require on the order of 500 slips in order to be economically feasible (this assumes that a major breakwater would be required) together with up to 30 acres of upland facilities and parking as shown in Figure 5.3. Functional requirements for such a facility at Glen Cove are:

Breakwater, vertical wall or rubble mound - 2,100 ft long.

Permanent (400) and transient floats 3,000 lineal ft.

Water depth in basin 10 to 18 ft at MLLW.

Open area for concessions, yacht club etc - 4 acres.

Space for residential or condominium development (to assist project financing) - 10 to 20 acres.

Open parking area - 400 cars - 5 acres.

Restrooms, showers, office, shop.

Public and private telephones.

Holding tank disposal, sewers, electricity to floats and landside, area lighting.

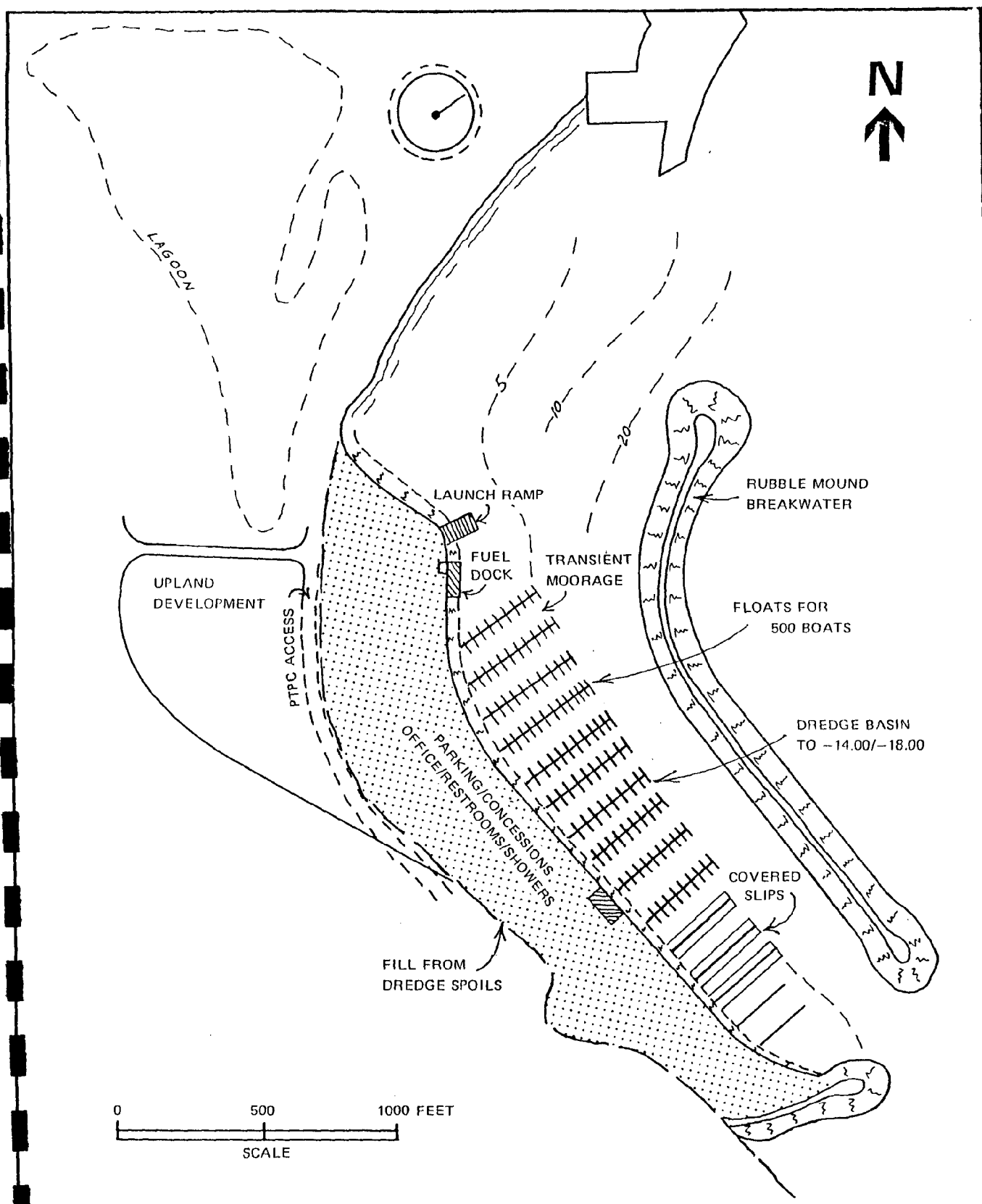
Fire protection system.

Fuel storage and supply float.

Boat haul out, marine rail or hoist (optional)

Tidal grid.

Launch ramp ( optional)



GLEN COVE INDUSTRIAL ANALYSIS

FIG. 5.3 MARINA



### 5.2.3: CONSTRUCTION COSTS

Costs for a marina at Glen Cove are:

DESCRIPTION	COST
Uplands Preparation	100,000
Dredging	750,000
Breakwater	3,750,000
Floats	3,000,000
Ramp or Hoist	150,000
Fuel float, grid	50,000
Office, restrooms, showers	67,500
Utilities	100,000
Parking, security	50,000
Sub total	\$8,017,500
Admin, engineering, permit	1,200,000
Contingencies @ 20 percent	1,843,500
TOTAL	\$11,061,000

### 5.2.4: OVERALL FEASIBILITY

The capital construction cost of a new marina at Glen Cove is seen above to be on the order of \$11 million or equivalent to \$22,000 per slip (excluding land acquisition). In order to recover the expenditure over 20 year period, revenues of up to \$7.00 per foot would be needed, over double the current average rate for existing marinas in Jefferson and Clallam Counties. Many authorities and private developers, such as the Port of Seattle and developers in Anacortes are now looking to uplands development as a means to assist with financing moorage construction. While this approach might be viable at Glen Cove for industrial development it would not work for pleasure or commercial options such as condominium development, a shopping

mall or convention center since it would not only conflict with the designated use but the site is also too far removed from the downtown area and main tourism destinations. The presence of the Mill is a further deterrent to residential or commercial use of the area.

Given the demand limitations, and potential difficulties in incorporating "spin off" development in the overall marina package, the use of Glen Cove for a large marina is considered to be unlikely.

#### 5.2.5: ENVIRONMENTAL ISSUES

Marina development proposals are often the subject of considerable objection by public agencies and citizen groups and the loss of the beach habitats and lagoon at Glen Cove would require considerable mitigation measures before Corps, Shorelines, and Hydraulics permits could be obtained. Although pleasure boat development in the area might be considered to be more palatable than the construction of industrial facilities, the impact of the large enclosed water area and breakwater is likely to be a source of concern to a number of agencies.

#### 5.3: DRY STORAGE MARINA

##### 5.3.1: DEMAND

Dry storage of boats is a popular alternative to a full fledged marina in highly developed residential areas with limited parking space or where wet moorage is at a premium. It offers relatively cheap storage for trailerable size boats and an owner does not need to be concerned with regularly checking his boat for leakage etc. It is not so applicable to rural areas or residential areas with a predominance of single family homes since it is much cheaper and almost as convenient as the dry storage option.

It is however, considered to be a valid alternative for this study since it eliminates a number of the cost and environmental difficulties expected with a marina development.

#### 5.3.2: FUNCTIONAL REQUIREMENTS

The dry storage concept is primarily applicable to motor boats of less than 25 feet but sailboats and larger craft are often handled.

A large modified fork lift truck or similar device picks the boat out of the water at a special ramp and stores it either in a covered rack type building with up to 3 levels or on blocks or cradles in an open storage area. Boat owners wishing to use their boats call in advance and the craft is placed in the water at a short term float to await their arrival. The system is efficient, economic on water space and easier from a permitting standpoint. However many boat owners, particularly of sailboats, are reluctant to allow their boats to be removed and placed in the water so frequently, fearing hull damage or distortion.

A typical layout for a facility capable of storing 150 boats under cover and 300 in an open yard is shown in Figure 5.4. Functional requirements for the scheme shown are:

Ramp - slope 12.5 to 15 percent grade and 100 to 150 ft wide.

Lift machines - 25 ton capacity, 15 ft height capability -

2 or 3 units

Storage building three levels 10,000 sq ft. (150 boats).

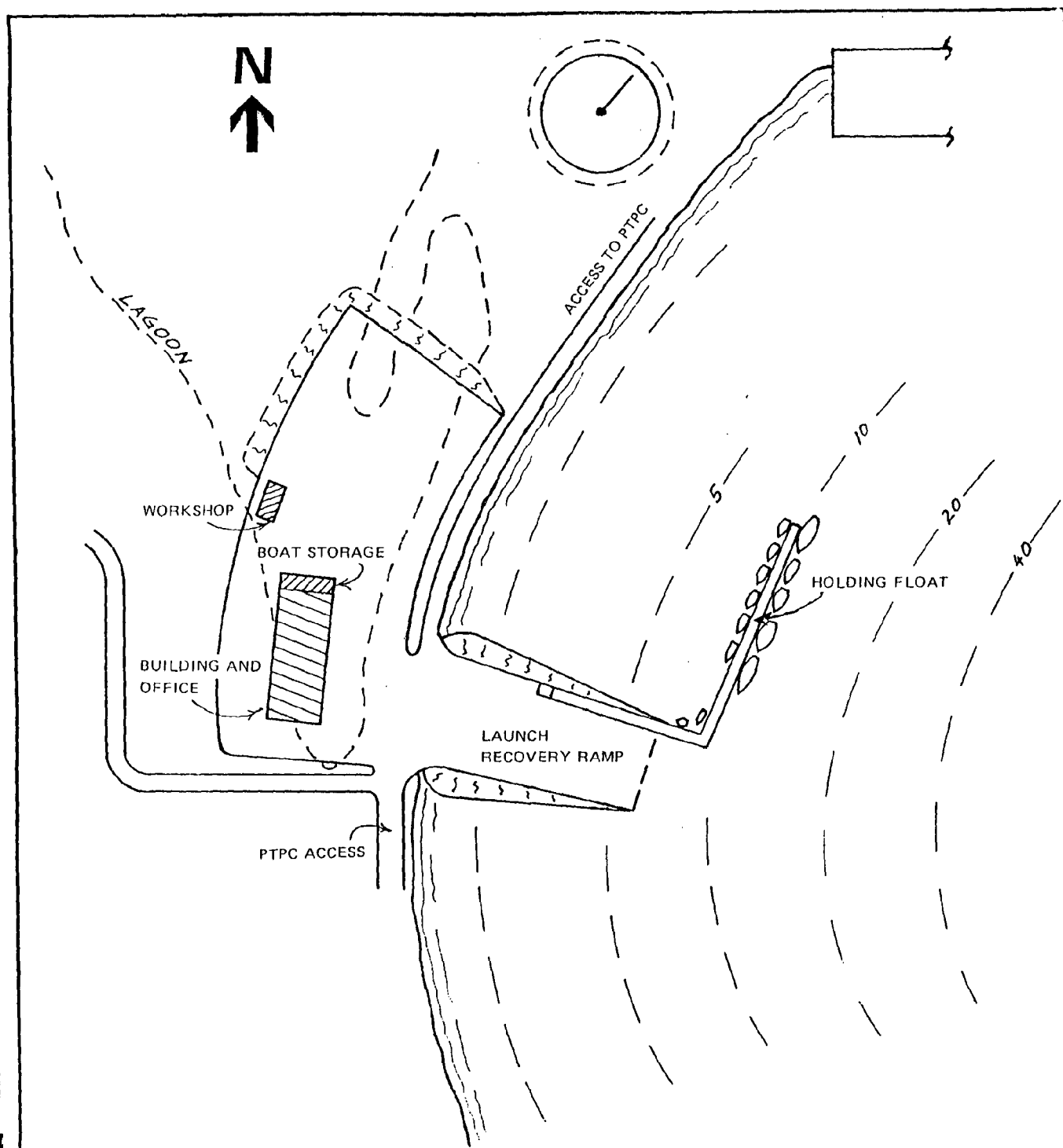
Open yard 3 to 5 acres.

Workshop, machine shops etc.

Customer parking for 250 cars.

Telephone, electricity, water, sewer.

Restrooms, showers office and shop.



GLEN COVE INDUSTRIAL ANALYSIS

FIG. 5.4 DRY STORAGE YARD

### 5.3.3: ENVIRONMENTAL FACTORS

The concept presents few environmental problems and little impact on the area apart from the need to fill in the south lagoon wetlands and reclaim a strip of land along the shoreline for the ramp and holding pier.

### 5.3.4: CONSTRUCTION COSTS

Costs for a Dry Storage Facility at the site are:

DESCRIPTION	COST
Uplands Preparation	400,000
Ramp and holding Float	750,000
Lift Trucks	900,000
Open Storage Yard	250,000
Covered storage building	300,000
Office, restrooms, showers	67,500
Utilities	100,000
Parking, security	75,000
Sub total	2,842,500
Admin, engineering, permit	342,000
Contingencies @ 20 percent	640,000
TOTAL	\$3,824,500

### 5.3.5: OVERALL FEASIBILITY

Although compatible with land use designations for the area and relatively cost effective, the dry marina concept is not considered applicable to Port Townsend. Given the character and attraction of the region with its emphasis on preservation, it is also most unlikely that conditions favorable to economics of a dry marina will occur in the future.

## 5.4: FISHERIES

### 5.4.1: FISH PROCESSING PLANT

#### DEMAND

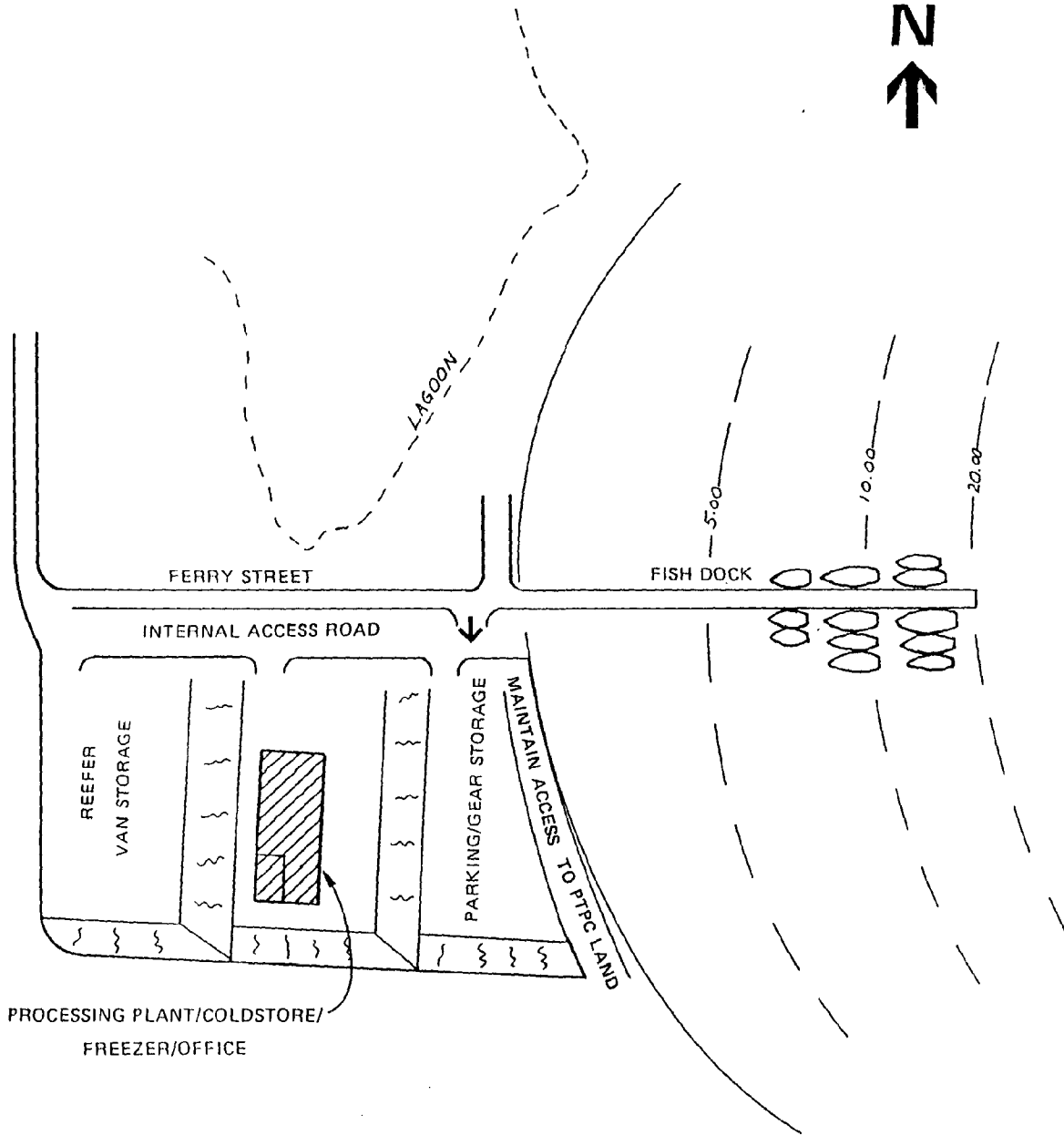
As public awareness of the nutritional and health value of fresh fish products continues to grow, the Pacific Northwest bottom fishery is also growing and supplementing the traditional salmon, shellfish and Dungeness crab fisheries. Sea farming and aquaculture projects are also becoming more common in the Pacific Northwest. Although 1980s projections (Washington Public Ports Study) of over 20 new shorebased processing plants in the Puget Sound are unlikely to be achieved, it is expected that a number of new plants will be established in the region in the next 5 to 10 years. A plant at Glen Cove would serve the immediate Port Townsend and East Jefferson County and as production grew, product could be trucked to Seattle to link in to the main domestic distribution channels.

A major advantage for Port Townsend is the reduced sailing distance from the plant to the fishing ground, cutting a day off the trip time when compared with Seattle.

#### FUNCTIONAL REQUIREMENTS

A new shore based fish processing facility will include an unloading dock, coldstore and central processing facility. Although the facility does not require flat land, it should be as close to the water as possible. Many also include fish meal and waste processing plants to meet discharge water quality requirements. A typical plant capable of processing 120,000 lbs of bottom fish per day with a work force of 50, will require:

Unloading/loading dock ....	300-500 ft and 16-18 ft deep at MLLW
Land.....	3 to 5 acres
Cold store.....	60,000 to 100,000 cu ft
Freezer unit.....	10,000 cu ft



GLEN COVE INDUSTRIAL ANALYSIS

FIG. 5.5 FISH PROCESSING FACILITY

Filleting/processing line  
 Waste disposal, processor or fish meal plant  
 Water service up to 75,000 gallons per day  
 Electricity, telephone, sewers  
 Fuel facility for fishing vessels (optional)  
 Chandlery (optional)  
 Dormitory or rest facilities (optional)  
 Reefer van storage and truck load out area (25 to 50 40 ft vans)  
 Employee parking  
 Gear Storage and net repair ....up to 5 acres (optional)  
 Moorage for fishing vessels

#### CONSTRUCTION COSTS

Construction Costs for a typical Bottom Fish Processing Plant are:

DESCRIPTION	COST
Site Preparation	40,000
Unloading Pier	650,000
Vacuum Pump, hoists etc	170,000
Reefer yard	50,000
Processing Plant **	360,000
Cold store and freezer	375,000
Cafeteria, workshops, office,	160,000
Utilities, waste disposal	350,000
Employee Parking, Access	75,000
Sub total	2,230,000
Admin, engineering, permit	200,000
Contingencies @ 20 percent	486,000
TOTAL	\$2,916,000

\*\* - Equipment excluded from costs



## ENVIRONMENTAL FACTORS

The main environmental concern over a fish processing plant will be the treatment and discharge requirements for waste products. Screening and treatment will be required for potentially large volumes of waste water and solids will require hauling off site or incineration. Care would be necessary to prevent any water quality deterioration that might affect the proposed aquaculture project.

Since the uplands area is located away from the lagoon wetlands there are no problems with fill and impacts on the surrounding area are not significant. An open piled unloading pier fits Dept of Fisheries Hydraulic permit guidelines and the project would cause only very minor loss of intertidal habitat.

## OVERALL FEASIBILITY

The establishment of a small fish dock and processing facility at Glen Cove is compatible with the designated use of the site and environmental limitations are minimal. The feasibility of the option appears to be hopeful and the level of business of the existing plant in the City is steadily growing.

A fish processing plant is therefore considered to be one of the favored development options for the site.

### 5.4.2: AQUACULTURE

The number of salmon rearing or farming projects in Washington is increasing with facilities recently constructed in Port Angeles and Crane Point off Indian Island. Plans to locate a series of pens to the south of Glen Cove are already in the permitting process and no major concerns have been expressed to date. Several other fish farming operations are proposed in the County and are currently under review. The development is compatible with the designated use of the area and in fact

requires very little land, except for access. Since the site is selected principally for the high water quality and moderate currents, any adjacent future development should not cause a deterioration of the water in the area.

#### 5.5: MARINE TERMINAL

##### 5.5.1: FERRY TERMINAL

An increase in ferry traffic to Port Townsend is likely to result from the development of the Point Hudson area as a festival and convention center, the increasing attractiveness of the downtown district as a tourist destination, the proposed catamaran ferry service to Seattle and the possible stopover by the new hydrofoil on the Seattle - Victoria run.

The new state ferry terminal adequately addresses the need for vehicular service and any new passenger only service would also choose a downtown location as a first choice. Development of a terminal at Glen Cove is therefore most unlikely.

##### 5.5.2: GENERAL CARGO TERMINAL

###### DEMAND

With the demise of the Seattle and North Coast Railroad, the only general cargo terminal in the area is owned and privately operated by the Port Townsend Paper Company. Their dock is used for loading pulp and paper products and the receipt of wood chips from barges moored in the Glen Cove area.

The establishment of a barge feeder service from the area to lower Puget Sound has been the subject of discussion since the closure of the railroad facility. Containers could be loaded onto a barge for transfer to shipside or railroad cars in Seattle or Tacoma and take advantage of the economies of interfacing to a large load center.

However, one of the main reasons for the railroad's failure was the impact of reduced truck haul costs following deregulation of the trucking industry. The cost of barging a container from the Port Townsend area to Seattle (assuming recovery of construction and operating costs) is likely to be on the order of \$300 to \$350, compared with \$200 to \$275 by road. This gap is unlikely to close in the near future as truckers are meeting increased competition by improved productivity and larger load capacities.

In the past, the railroad carried sufficient timber products to enable it to compete with a regulated trucking industry. The regional economy has become much more service based in recent years, as evidenced by the increasing median age of the population as the timber business has declined. This has caused a centralizing of ship bound peninsula log exports from Port Angeles and very little lumber now moves by waterborne transport.

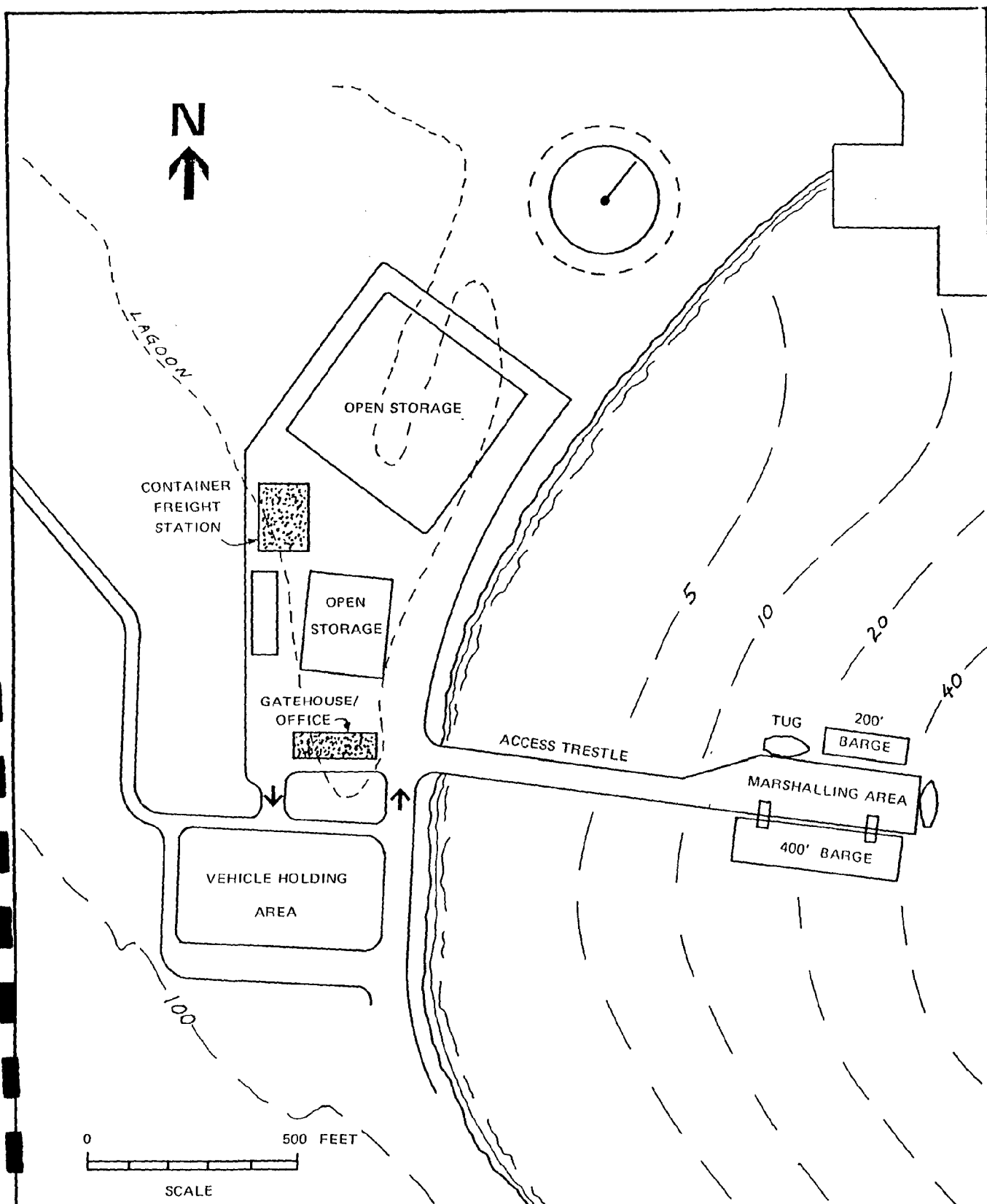
A reopening of the mills in the future is expected but demand will almost certainly be domestic and again the truck haul from Port Townsend to lower Puget Sound or the main rail routes will be more economic than a barge system.

It should be noted that regional government entities are in the process of negotiating the acquisition of the railroad between Port Townsend and Port Angeles. A short line operation using the existing pier and transfer span has been determined to be economically feasible and competitive.

#### FUNCTIONAL REQUIREMENTS

In the event that a strong demand was established for a barge dock in the Port Townsend area, the Glen Cove offers a potential location for the loading pier, access trestle and back up area for a modest general cargo operation shown in Figure 5.6.

Functional requirements for a terminal capable of handling 200 foot dry cargo barges (5000 tons) are:



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FIG. 5.6 BARGE TERMINAL

Water depth.....20 ft at Mean Low Water  
 Maximum wave for loading. 0.75 to 1.0 ft  
 Length of dock.....500 ft (2 barges or 1 plus tug)  
 Back up storage area.....10 to 20 acres  
 Equipment.....Mobile or fixed crane (40 tons)  
                     .....Fork lift trucks ( 15 and 40 tons)  
                     .....Trailers  
 Access.....Truck access (32 ft width)  
 Truck holding area.....2 to 3 acres  
 Weighbridge (optional)  
 Buildings.....Warehouse/container freight station  
                                     (6000 sq ft)  
 Utilities.....Water (low), fire water  
                                     ..Electricity (2 and 3 phase supply)  
                                     ..Telephone (5 lines)

#### ENVIRONMENTAL IMPACT

The major impact associated with the construction of a barge dock at the site will be the demands on the local road system of large trucks and trailers. Additionally the large wetlands fill requirement at the South lagoon would cause state and local agencies considerable concerns. As for almost all developments, sewer system needs are also a problem.

## CONSTRUCTION COSTS

### Construction Costs - Barge Feeder Service Terminal

DESCRIPTION	COST
Uplands preparation	1,000,000
Open piled cargo dock	1,440,000
Access pier	1,625,000
Open storage yard	750,000
Container Freight Station	180,000
Office, maintenance shop	45,000
Utilities	100,000
Parking, truck holding area	75,000
Sub total	5,215,000
Admin, engineering, permit	625,000
Contingencies @ 20 percent	1,200,000
TOTAL	\$7,040,000

## OVERALL FEASIBILITY

It is doubtful that Eastern Jefferson County could generate enough cargo within the next 10 years to support a new barge terminal at Glen Cove. Much more probable might be the reconstruction of the existing Railroad pier at the Boat Haven to handle containers with much less impact on wetlands areas and the intertidal habitat.

A further deterrent to the Glen Cove site is the shallow inshore depth in the cove. While a dredge and fill solution might create a marginal type wharf alongside a reclaimed open storage area, costs would double and the procurement of the necessary permits would be extremely difficult.

## 5.6: OIL RELATED INDUSTRIES

### 5.6.1: OIL RIG PLATFORMS

A number of companies have investigated the Puget Sound area as a location for the construction of oil rigs for North Alaskan exploration and petroleum production wells. The units are either steel or concrete structures which are assembled at yards adjacent to deep water and then towed, usually as a complete unit, to the well location. Since most rigs sit on the sea bed in up to 80 feet of water, the depth required for towing often is as much as 100 feet. Rigs are also towed on barges and tilted into position, requiring 40 to 50 feet of water for the initial launch.

Functional requirements for a rig fabrication yard vary with the type of rig to be constructed but an all purpose yard will require the following:

- Access to deep water - 100 ft preferred at launch site.

- Sheltered anchorage to hold rig and complete final assembly process.

- Good soils for support of marine ways or launch ramps.

- Work yard up to 25 acres, flat and adjacent to water.

- Highway access with mild slopes and few curves for large trucks.

- Parking for 500 to 800 workers (peak).- 2.5 to 5 acres.

- Assembly, welding and misc workshops - up to 200,000 sq ft total.

- Cafeteria and rest rooms for workers

- Local accommodation for temporary workers.

- Electricity - 2 and 3 phase supply -

- Telephone.

- Sewers.

- Water supply (20 to 25,000 gals per day).

The Glen Cove site offers few advantages for a rig fabrication yard. It has little flat land without filling the entire south lagoon, the cove is too shallow for a deepwater rig and local objections to a sudden influx of almost 1,000 workers is likely to be intense.

#### 5.6.2: NORTH SLOPE MODULES

The construction of modules for the North Slope of Alaska and the Canadian Beaufort sea is likely to continue for at least the next 10 years. Complete buildings, with all machinery, utilities, and fittings are assembled in Tacoma and Everett for barging up to the oil fields once a year when the arctic ice retreats for a few weeks in late July. Requirements for a module fabrication and assembly yard are similar to those described above with the exception that the completed units are moved onto large barges over a dock or concrete apron by special jack up trailers. While marine side requirements such as water depth are less severe than for oil platform launching, a sheltered location is critical to the complicated and delicate launch process. Additionally the time window for barging the units to the Arctic is extremely short and weather delays at launch time could cause the failure of the entire operation.

A typical yard will require the following:

Water depth - 35 to 40 ft at launch site.

Sheltered anchorage for module loadout.

Good soils for support of module.

Bulkhead, dock or apron with 30 to 35 ft depth alongside.

Work and materials storage yard up to 25 acres, flat and within 1000 ft of load out area.

Highway access with mild slopes and few curves for large trucks.

Parking for 250 to 600 workers (peak).- 2.0 to 4 acres.

Assembly, welding and misc workshops - up to 200,000 sq ft total.

Cafeteria and rest rooms for workers



Local accommodation for temporary workers.

Electricity - 2 and 3 phase supply.

Telephone.

Sewers.

Water supply (20 to 25,000 gals per day).

The environmental problems associated with a module fabrication yard are a little less than for the rig assembly yard since almost no work is done on the water. However, the wetlands fill issue is critical and local objections to the increased employee population would be equally strong. The provision of an adequate sewer system would also be expensive.

It is not therefore considered that the Glen Cove site would be attractive to potential developers of a yard in the Port Townsend area.

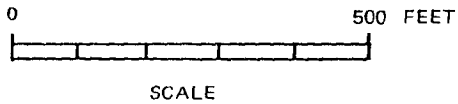
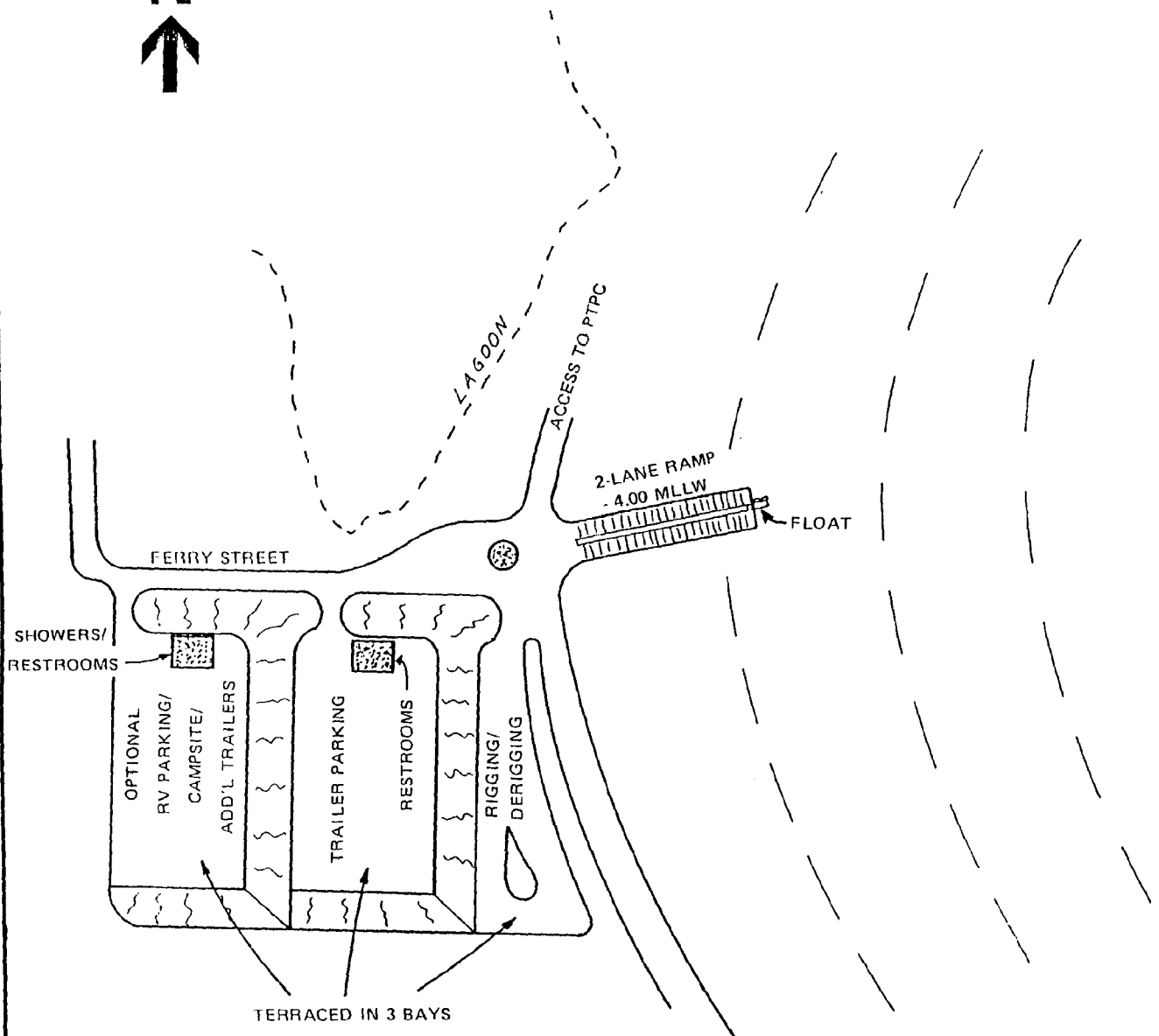
#### 5.7: BOAT LAUNCH FACILITY

##### 5.7.1: DEMAND

While not strictly an industrial use, the provision of a small boat launch ramp at Glen Cove would fit in with an industrial park development and also raise few environmental issues.

It appears that there are never enough boat launch ramps in Jefferson and Clallam counties in the summer months. An additional facility at the site would relieve pressures on the downtown area for trailer storage and parking.

Although an area reserved for RV parking and hook up might add to the attraction of the area, it could be considered a non-compatible use of the site.



GLEN COVE INDUSTRIAL ANALYSIS

FIG. 5.7 SMALL BOAT LAUNCH RAMP

#### 5.7.2: FUNCTIONAL REQUIREMENTS

The facility shown in Figure 5.7 would handle an average of 160 launches (=160 in and 160 out) on a peak day or up to 12,000 launches a year. Functional requirements are:

Four lane launch ramp with one float per 2 lanes.

Parking for 200 cars and trailers - 3 to 4 acres.

Rest room.

Water for wash down.

Public telephone, electricity.

#### 5.7.3: ENVIRONMENTAL FACTORS

The wetlands fill issues associated with the southern lagoon are avoided by terracing the area to the south of the Frederick street right of way at the beach.

The construction of the ramp will cause a minor loss of intertidal habitat but this is not expected to warrant mitigation on a large scale. Other concerns will include run off from the parking areas and drain field location for the restrooms.

#### 5.7.4: OVERALL FEASIBILITY

Although it falls outside the scope of industrial development, a boat launch ramp fits in well with the characteristics of the site. The construction of the ramp would also facilitate an extension of the existing repair business adjacent to the beach and could serve as a catalyst for more development. Unfortunately boat launch ramps generate little, if any revenues and therefore sponsorship of construction would almost certainly be a major obstacle.

## 6: SUMMARY

The Glen Cove site presents a number of significant constraints to large or medium scale marine or waterfront related industrial development.

Probably the most significant limitation is the lack of readily developable flat land in parcels larger than 5 to 10 acres. Although a number of industrial options, such as a marine repair facility, will require less than 10 acres at the outset, future expansion potential must be considered and a 20 acre developable parcel is considered a minimum requirement.

This lack of available usable waterfront land then directs attention to the south lagoon of the Port Townsend Paper Kraft Company. Although the formation of the lagoon was partly man made it is now an important habitat for waterfowl, small marine mammals and a variety of wildlife. Any application to fill in the wetland area to create an industrial park, although compatible with local land use comprehensive plan designations, would certainly meet strong opposition from county, state, and federal agencies.

The shallow water depth in the cove is a restriction on developments such as a general cargo terminal, oil rig platform assembly yard and a large vessel ship repair facility. Dredging is not considered be a viable means of attaining the required depths, since the littoral patterns point to an accumulation zone at the site.

Other development constraints are less significant but detract from the attractiveness of the area for large scale development. These include the need for a complete sewer system and possible treatment plant and the limitation of the entry roads for high volume traffic or heavy trucks.

Any loss of the intertidal habitat and sand beach will require mitigation by replacement of lost areas or extremely strong justification before County, State, and Corps permits could be issued. This would be a strong impediment to development of pleasure boat moorage or any extensive shoreside construction since it would be difficult to reply to arguments that demand could be accommodated in the Boat Haven area, in accordance with the recommendations of the adopted Port of Port Townsend Comprehensive Plan.

As shown in the accompanying table overleaf, the most favored forms of water dependent development for the area are those that occupy a minimum length of shoreline and also do not require immediate adjacency to the waterfront for back up land. In order of apparent overall feasibility these are:

1. A fish processing plant (Limited scale operation - no long term moorage)
2. Pleasure boat repair on a small scale (Limited storage for haul outs).
3. A marine rail or graving dock for large commercial boat repair.

and although not an industrial development - A small boat ramp and parking area would fit well with the site characteristics.

Although the main conclusion of the study is that the site offers little attraction to large scale waterfront development, it does appear to have a lot to offer as a general industrial park. The sloping wooded basin could be subdivided into 3 to 5 acre plots with interesting views on the water and quick access to the City. Development of the fish processing plant and the aquaculture project both fit in to this scenario.

A road and utilities network running parallel to the natural site contours. With access to the beach, walking and jogging trails and some minimal beachside recreational facilities, Glen Cove could become an attractive and active industrial/business park.

# Industrial Development Options - Comparison

Development Alternative	Demand	Environmental Impact	Compatibility with site. Uplands Marine	Utility Concerns	Construction Cost
Commercial Vessel Repair Yard	moderate	moderate	poor	moderate	\$9.84
Pleasure Boat Repair	moderate	moderate	fair	minimal	\$3.42
Pleasure Boat Moorage	moderate	severe	good	moderate	\$11.06
Dry Storage Facility	low	moderate	fair	moderate	\$3.82
Fish Processing Plant	moderate to high	minimal to moderate	good	waste/sewers	\$2.92
Aquaculture Projects	moderate to high	minimal	good	minimal	not priced
Barge Terminal	low	moderate	poor	moderate	\$7.04
Oil Platform Yard	moderate	high	poor	sewer	not priced
North Slope Modules	declining	high	poor	sewer	not priced
Boat Launch Facility	fair	minimal	good	minimal	not priced

## REFERENCES

### Telephone conversations with:

Juan De Valier - Port Townsend Paper Company  
Scott Flickenger - Fresh Fish Market.  
Phil Kauzloric - Wa Dept of Fisheries  
Alan Moore - Wa Dept of Ecology  
Mary Schroeder - Port Townsend Paper Company  
Gerald Thorsen - Dept of Natural Resources

### Interviews with:

Mark Burn - Port Townsend Boat Works.  
David Goldsmith - Jefferson County Planning Dept.  
Gail Gunderson - Jefferson County EDC.  
Dick Kint - P. U. D.  
Bob Leach - Port of Port Townsend  
Casey McKinney - Admiral Marine.  
Mitchell Press - Jefferson County Planning Dept.  
George Yount - Port of Port Townsend

### Reports:

Port Systems study for The State of Washington (1980) - CH2MHill  
Recreational Small Boat Moorage Study (1980) - Corps of Engineers  
Glen Cove Water Supply Feasibility Study (1982) - Hosey and Associates  
Comprehensive Plan for the Port of Port Townsend (1981) - Reid Middleton  
Shoreline Management Master Program for Jefferson County and Port Townsend (1983) - Jefferson County Planning Dept.  
Jefferson County Comprehensive Plan (1979) - Jefferson County Planning Dept.



